Review: Time machines, ethics and sustainable development:

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DOI:
10.1080/09540962.2018.1477677

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Document Version
Peer reviewed version

Citation for published version (Harvard):
Thomson, I, Grubnic, S & Georgakopolous, G 2018, 'Review: Time machines, ethics and sustainable development: accounting for inter-generational equity in public sector organizations', *Public Money and Management*, vol. 38, no. 5, pp. 379-388. https://doi.org/10.1080/09540962.2018.1477677

Time Machines, Ethics and Sustainable Development: Accounting for Intergenerational Equity in Public Sector Organisations.

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Abstract

This review article explores the key challenges associated with effective intergenerational equity accounts in relation to the public sector governance of sustainable development transformations. These challenges include; defining generations, principles of equity, appropriate time horizons, accounting for long term future projections and the scope these accounts. Three different approaches to intergenerational equity accounting are evaluated and a framework for future research is outlined.

Introduction

Intergenerational equity is used in many ways for many purposes and in many different contexts. Intergenerational equity predates its use as a foundational principle of sustainable development (Brundtland Commision, 1987). For example, it was identified as the golden rule of public finance accounting (Pallot, 1991; Robinson, 1998). Intergenerational equity has been discussed as the reason for accruals accounting, the development of the balance sheet, reserve accounting, contingencies and calculation of unfunded liabilities in public sector organisations (e.g. Colquhoun, 2010). Intergenerational equity is used in many other disciplines and accounting related contexts. These disciplines and contexts include actuarial science (*Lyon & Amidharmo,* 2016), aging studies (Kohli, 2008; Preston, 1984), fiscal planning (Lisenkovaa et al., 2015), public sector planning (Williamson & Rhodes,2011), demography (Preston, 1984) , legal studies (Weiss, 1992), climate change (Gray, 2010), biodiversity (Norton, 1999; Roemer & Suzumura, 2007), social welfare policy development (Williamson et al., 2003), economics (Dasgupta, 1999), public investment programmes (Colquhoun, 2010) and pensions (Williamson & Rhodes, 2011; Kohli, 2006).

Despite claims of the importance of intergenerational equity in all of the above contexts, there is a recognised dearth of reliable and comprehensive evidence about or accounting for intergenerational equity. Intergenerational equity forms part of the debate on accounting for sustainability (e.g Bebbington and Larrinaga, 2014; Gray, 2010; Russell and Thomson, 2008) but these can largely be read as calls for the development of intergenerational equity accounting, rather than reporting on accounting practices. The existence of of intergenerational equity in corporate social reporting disclosures is as rare as truth in political debates.

This review will explore the characteristics of intergenerational equity that may explain the absence of robust intergenerational equity sustainable accounting (IESA) and wll argue for the need to

develop IESA concepts and practices for use in public sector organisations in order to make intergenerational equity visible, thinkable and governable.

This paper will include a discussion of the different notions of generations, issues to do with equity, provide examples of intergenerational equity accounts and discuss the problems of what is effectively accounting for the future. The paper will finish with a call for further research into developing more effective forms of intergenerational equity accounting. The next section will discuss the idea that public sector organisations function as institutional time machines.

Public Sector Organisations as Time Machines

Public service organisations are institutions that enable time travel (Stout, 2015) distributing costs, benefits, risks, responsibilities, liabilities and possibilities backwards and forwards in time. Many public sector organisations act as intermediaries redistributing resources among individuals, private institutions and public institutions across time and space. For example an environmental tax on companies redistributes income to the government who then may choose to invest this revenue in a long term project designed to remediate biodiversity damage. This transfer means that resources are unavailable for current consumption allowing future generations to benefit from this investment. An example of travelling back in time can be seen in court cases taken by governments against tobacco companies for retrospective damages caused by tobacco consumption to compensate for the additional healthcare expenditure (Thomson, et al. 2015). Public sector organisations can also license or legitimate organisations and individuals to destroy natural resources (e.g. our climate system) to allow current consumptions at the expense of all future generations and other forms of life on our planet. It is argued that public sector organisations have an obligation to facilitate justice across time, particularly when sustainable development imposes an obligation of current generations for future generations (Weiss, 1992; Attfield, 2010). Public Sector organisations are at the centre of operationalising intergenerational equity as well as ensuring intergenerational and intragenerational equity. The underlying concepts of economic, social community and environmental system maintenance are implicit in the public governance and accountability.

Intergenerational equity can be conceptualised in many ways, but it is an important lens through which different public policy options can be crtiqued, evaluated and developed (Willets, 2010, Williamson, et al, 2003; Weiss, 1992). The social welfare state has been underpinned by an implicit social contract between generations and this implicit social contract has been given greater resonance through nation state's acceptance of the UN Sustainable development goals (United Nations, 2015). In the context of sustainable development intergenerational equity is an ethical voice for the needs and rights of future life.

Intergenerational equity concerns need to find a voice in organisational decision making, political systems, judicial systems, professional expertise and the market. One way to give intergenerational equity a voice or make it visible or thinkable or governable in these different contexts is through accounting and accountability processes (Gray, 2010; Bebbington & Larrinaga, 2014). However, institutions, including public sector organisations, are not designed to for considering the long term implications of integrating intergenerational equity in decision making process and there are many biases towards the short term (Dasgupta et al., 1999). In the context of sustainable development these decisions is might include intergenerational consequences of nuclear power, marine life,

freshwater supply, industrial pollution, soil, biodiversity, social mobility, educational provision, healthcare systems, climate change, city and urban planning, education, public debt, taxation and demography, to name but a few!

What is a Generation?

At the crux of IESA is the definitional problem as to what is a generation. There are many different approaches to defining a generation (Piachaud, et al., 2016). A generation can be understood in the context of lineage of a family – grandmother, mother, and daughter. The average length of a generation defined relative to famial structure varies across nations and across time. For example in developed countries the current average time for an individual to be born and produce their own offspring is around 30 years, whereas 100 years ago a generation was considered to be around 20 years. whereas in developing countries the same life events occur in a much shorter period of time.

Familial generational definition is difficult to operationalise in the governance of society by states or public sector organisations. A common approach to defining a generation in this context is a age cohort approach. Effectively a generation is defined as children born within a specified range of dates. The assumption here is that these individuals will be subject to a similar set of social, economic and economic factors during their life. A generation is a cohort of individuals born in a limited period who are assumed to face historic events at similar ages and move up through the key life stages in unison (Williamson, et al,. 2003).

From the perspective of public sector governance a generation is seen to be a basic unit of social reproduction and social change to be governed. The size and composition of a generation within public sector governance is influenced by the type of state interventions deemed to be required. A common approach to using generations in public sector governance is to divide the population into under 16 (children requiring care, educational development and not in work), working age (adults generally considered self-supporting due to employment) and over 64 (adults retired from work requiring state support, care and additional healthcare). However, the age boundaries of these three categories can vary between states and over time as different government policies are introduced. Different public sector organisations may use different cohort definitions depending on the nature of their statutory regulations. A cohort approach to defining generations means that these generations are not of standard length, but constructed from a specific governance need or statistical protocol. When interpretting different intergenerational accounts the user cannot assume that a generation has a standard definition, which can create considerable difficulties in comparative analysis between public sector organisations, nations or over time.

This lack of comparability is further complicated by the use of generational analysis by social science researchers and political/social commentators (Bengtson, 1993; Kohli, 2008). A typical approach in these contexts is to use very broad, often globalised ‘named’ age cohorts based on key historical events and stereotypical behavioural assumptions. The parameters of these age cohorts depend on a conceptualisation of some form of commonality in experience, rahter than from a public sector governance perspective. For example it is common to refer to children born in the UK in the 1980s and 1990s as ‘Thatcher’s children’ denoting individuals with a lack of concern for collective issues and a strong sense of individualism, attributed to the reform of the UK welfare system, privatisation and de-industrialisation.

Social science research and political commentators often place other labels on generations to differentiate societies over time allowing a historic periodisation of their research. Commonly used cohort labels include Baby Boomers (those born between 1950- 1964), Generation X (those born between mid 1960s-early 1990s), Millenials (those born in the mid 1980s to 2000), Generation Z (those born in the mid 1990s until now). Whilst these labels are widely used there is no consensus on the actual start and end date of the age cohorts, meaning they can be problematic for use in IESA. It is also important to recognise the limitations of the assumption of homogeneity within a generation. A generation is a largely a time-based measure which does not recognise variations in personal circumstances or structural inequalities associated with class, power, resource, race, ableism or gender.

These named cohorts are often used in policy debates relating to social welfare policies (Willets, 2010) and in other public sector governance issues. See for example the following quote,

'We all know that there's a change coming in higher education, and it's not only government agencies and Brexit driving it. A new digitally innate generation of students is just beginning to enter our universities, prompting the question: are we ready for this influx of industrious, collaborative and entrepreneurial learners? Welcome to Generation Z, a generation defined by Anne Kingston *as "smarter than Boomers, and way more ambitious than the Millennials".'*

www.theguardian.com/higher-education-network/2017/jul/10/generation-z-starting-university-higher-education-ready - accessed 25 Septemeber 2017)

This section suggests that operationalising IESA is not straight forward due to the socially constructed notion of generations. This does raise a number of questions for further research and reflection. These include; What is the appropriate definition of generations? What definition of generations is used in research publications? What definition of generations are used in intergenerational accounts? To what extent are assumptions of homogeniety within a generation valid? What is the intentionality of the producers of these accounts? What zones of visibility and intergenerational governance are enabled by the definition of generations?

What generations and what aspects of equity should we be accounting for?

The previous section discussed the variability in different definitions of a 'generation', but in order to develop forms of accountability for intergenerational equity we need also consider the interdependence between generations that co-exist in the same time and space and unborn generation, however defined.

A critical dimension of sustainable development is that future generations have the right to inherit the earth in at least as good condition as did their predecessors and the responsibility to leave it in no worse condition than when they pass it on (Gray, 2010; Roemer & Suzumura, 2007; Attfield, 2010). Intergenerational equity implies each generation are equal in relation to social, economic and environmental systems with no privileges attached to any generation dead, living or unborn.

Weiss (1992) identified three normative and interrelated principles of intergenerational equity. Principle One is that each generation must not unduly restrict their options to meet their needs and satisfying their values. Principle Two is that each generation must conserve the quality of the planet in order that it is at least no worse condition than in which it was received when it is passed on.

Principle Three is that each generation should provide its citizens with equitable rights of access to the legacy of past generations and conserve these rights of access for future generations.

Weiss (1992) argues that governance mechanisms should be developed in order that institutions should not authorise present generations to exploit resources to the exclusion of future generations or impose unreasonable demands on the present generation to meet undetermined future needs. This raises the problem of predicting the needs and values of future generations. Whilst recognising the difficulty of future predications, it is important for each generation to recognise their rights and responsibilities as part of a larger sense of an intertemporal system of humanity (Rawls, 1972). Within intergenerational equity governance and accountability it has to be recognised that it is not possible to accurately predict these values or needs, however institutions should adopt a precautionary approach in applying intergenerational equity thinking taking account of foreseeable situations and their applicability to as diverse a set of cultural traditions, social norms, economic and political systems.

Another important consideration for IESA is how far into the future (or back to the past) should considerations of equity be undertaken. Much of intergenerational research is dominated by considerations of equity amongst living generations within a country (e.g Bengtson, 1993; Cardarelli et al.,2000; Preston, 1984; Williamson et al., 2003). Often the intergenerational sharing of burden and rewards is considered just or fair to the extent that each successive generation can expect to receive the same treatment as the preceding and following ones (Pichaud et al., 2016; Willets, 2010). Intergenerational equity among living generations is not considered sufficient for sustainable development intergenerational equity considerations.

Intergenerational equity for sustainable development requires a much longer time frame than those normally associated with public sector governance of welfare policies, fiscal planning or pension payments. Different cultures, religions, states and international laws/treaties share a belief that the livings are only temporary stewards or trustees of our plant with obligations and responsibilities for the future. One example is the seven generation rule attributed to the Iroquois nation of North America.

"We are looking ahead, as is one of the first mandates given us as chiefs, to make sure and to make every decision that we make relate to the welfare and well-being of the seventh generation to come. What about the seventh generation? Where are you taking them? What will they have?" Lyons, 1994 page 174.

The time frame of any intergenerational equity account for sustainable development will be critical to its effectiveness in governing intergenerational equity concerns as well as the scope of the issues related to sustainability and the implied notion of equity.

Pichaud et al (2010) provide a useful framework to explore intergenerational equity accounting concepts and practices which has been represented by the author in Table 1.

Table 1 Intergenerational Equity Evaluatory Framework

Generational Relationships	**Scope of Equity Considerations**		
Equity between living generations	*Respect*	*opportunities*	*living standards*

Private Transfers between living generations	*Burden of caring*	*Private care, future life chances, discrimination and gender impacts*	*Savings, debt, inheritance*
Public Transfer between living generations	*Burden of public debt inherited*	*Fiscal fairness, burden of taxes and pension contributions*	*Value of investment, quality of social, economic and environmental systems*
Equity between living generations and future generations	*Legacy state of our planet, social and economic*	*Distributive justice of global impact of unsustainability*	*Rights based approach to the yet-to-born*

Intergenerational Equity or Intergenerational Equality?

Another aspect in developing IESA is the difference between the two related concepts of equality and equity. Equality and equity are two different concepts. For example, it is possible to be equitable without distributing everything equally. Intergenerational equity recognises the right of each generation to use planetary resources for their benefits whilst not restricting the options of future generations to do the same. However, this does not mean each generation must consume the same resources in the same way. Equality is only one of the three basic principles by which distributive equity outcomes should be evaluated or accounted for. The other principles are need and merit (Kohli, 2006; 2008). For example, inequality in social welfare provision among different age cohorts that takes into their differential needs does not violate intergenerational equity principles.

Kohli (2006; 2008) argued that there are strong grounds for justifying unequal public sector provisions based on the different needs of age cohorts. Examples include medical services and pensions to the elderly, maternity services to families, education provision to children and support to those with disabilities (e.g. Esping-Andersen, et al., 2002). Unequal provision can also be justified through a perception of legitimated merit associated with a particular merit. For example, in many countries there is a sense that the eldery deserve free public transport or subsidised entry to cultural events, given their contribution to society over their lives. Arguments based on merit and needs of specific generations can also be applied to aspects of sustainability. For example a generation that inherits lands heavilly contaminated by nuclear waste needs greater resources to remediate this damage for their own and future generations.

Evaluating intergenerational equity accounting practise.

This section will review three forms intergenerational equity accounting practices from the perspective of the their intended purpose, implied definition of generations, suitability for governing sustainability intergenerational equity, time frame and implied notion of equity. These three practices are generational accounting (Bengsten, 2003, Kohli, 2008), Index for intergenerational

equity (Gange, et al. 2016), UN Sustainable Development Goals (United Nations, 2015). These practices were selected as representing the range of different accounting methodologies applied to the challenges of IESA.

Generational Accounting

Generational accounting builds on an economic forecasting methodology that is extensively used in different national and public sector governance (Esping-Andersen & Sarasa, 2002; Auerbach et al., 1994; Cardarelli, et al., 2000; House of Commons, 2017; Lisenkovaa et al., 2015) Generational accounting projects the future distribution of welfare payments, resource transfers and tax burdens across contemporary age cohorts' decades into the future. (Williamson and Rhodes, 2011) by calculating net tax balances for different age cohorts. These future-oriented accounts model current and planned tax and transfer policies in conjunction with projections of different variables such as population, government expenditures, government policies and a social discount rate (Auerbach et al., 1994; Dasgupta et al., 1999). The accounts produce figures on specified age cohort's projected lifetime net tax payment (often analysed seperately by gender) that are then compared to evaluate the intergenerational equity of specific government policies.

Most supporters of generational accounting use a relatively narrow understanding of intergenerational equity. A common assumption in generational accounting is that generations should not pay a higher share of their lifetime incomes to the government than current generations (Bengston, 1993). Generational accounting has recently been captured by neo-liberals as part of their programme to reduce the tax burden and despite its roots in economic modelling is inherently political (Willets, 2010; Williamson and Rhodes, 2011; Williamson et al., 2011). The typical generational accounting approach to defining generations is to use three categories of the living – children, working population and the retired. The time period of many generational accounts is relatively short when compared with that required for sustainable development (Brundtland, 1987; Weiss, 1992). For example, Lyon & Amidharmo (2016) noted that the 40 year period adopted by the Australian Government is an inadequate period for evaluating government policies and noted that a number of actuarial techniques exist that could this model to 100 years and build in more robust future scenario analysis, including sustainable development policies..

Although the intergenerational equity debate now includes a wider range of issues, including the environment, sustainable development, and global warming (Attfield 2010), the use of generational accounting is largely restricted to evaluating governmental fiscal programmes and expenditure plans (Kohli 2008). When viewed from IESA perspective generational accounting is is off limited use as it focusses on tax and public sector spending for living generations. Generational accounting do not account for the values or impacts of what the tax raised is spent on and it excludes most of the critical aspects of sustainable development (Williamson and Rhodes, 2011). However, the methods associated with the future orientation of generational accounting are worthy of consideration in the development of IESA.

Some of the principles and processes associated with generational accounting may be adaptable to IESA, assuming the time period can be extended to incorporate future generations, the use of social discount rates is dropped (discounting is considerable inappropriate given its calculative disregard for the future, Dasgupta et al., 1999), consideration of different values and non-financial outcome indicators, and it incorporates government sustainable development policies. Table 2 provides an overview of generational accountings' strengths and weaknesses in relation to IESA. The elements highlighed and in italics represent strength and the elements in bold represent weaknesses.

Table 2 Evaluation of the Strenghs and Weaknesses of Generational Accounting

Generational Relationships	Scope of Equity Considerations		
Equity between living generations	*Respect*	**opportunities**	*living standards*
Private Transfers between living generations	*Burden of caring*	*Private care, future life chances, discrimination and gender impacts*	*Savings, debt, inheritance*
Public Transfer between living generations	*Burden of public debt inherited*	*Fiscal fairness, burden of taxes and pension contributions*	**Value of investment, quality of social, economic and environmental systems**
Equity between living generations and future generations	**Legacy state of our planet, social and economic**	**Distributive justice of global impact of unsustainability**	**Rights based approach to the yet-to-born**

Intergenerational Equity Index 2016 (IEI-16)

This index is an example of what Russell and Thomson (2008) refer to a sustainable development indicator (SDI) set (also see Dunlop & Trebeck 2012). SDIs involve the creation of a basket of indicators that represent particular dimensions of sustainability in order to contribute to the accountability and governance of some problematic issue. IEI-2016 was selected for review as it is specific to intergenerational equity, attempts to address some of the weaknesses of generational accounting and was a voluntary initiative by a non-profit, non-partisan organization[1]. The Institute des Generations was formed with the objective of creating and disseminating tools, analysis, and proposals on issues related to intergenerational equity. IEI-16 is the second iteration of their index, the previous index was issued in 2012 (Gagne et al. 2016)

IEI-16 was designed to address two core issues:

- Has the living standard of young people improved or deteriorated?
- Have power, wealth, and jobs been shared more or less equally across generations?

IEI-16 incoporated 30 social, economic and evironmental indicators (see table 3) covering the period 1976-2013 with 1990 as the reference year. The index analyses the relative standard of living for young people against their parents' generation this relative standard of living between different provinces in Canada. The main generational units used in IEI-16 are age cohorts, 16+, 25-34, parents.

TABLE 3 ABOUT HERE

IEI-16 accounts for intergenerational equity in a specific geographic area using a relatively broad definition of equity but using a very narrow range of age cohorts and a historic perspective. It incorporate most of the elements accounted for in generational accounting, but only reports on

[1] The Institute des Generations was created by Quebecers to improve the quality of life across all generations in their province.

equity between living generations and demonstrates a strong socio-economic bias, with only 4 environmental indicators. It differs from generational accounting by moving beyond tax revenue and expenditure forecast to incorporate non-financial indicators as proxies for the impact of government policies. However, unlike generational accounting it does not provide a future projection of the impact of these policies on future generations, but similar to generational accounting it does not extend to future unborn generations or deal with a comprehensive range of sustainable development issues. Table 4 provides a summary of the strengths and weakness of IEI-16.

Table Three Composition of the IEI-16

Social		***Economic***		**Environmental**
Unemployment rate	Average length of unemployment	*Median income after tax*	*Pay equity: Weekly salary of women/weekly salary of men*	Emissions of greenhouse gas
Income inequality: Gini coefficient	Median net assets,	*Average number of hours worked,*	*average rent for a 2 bedroom / median income after-tax*	Concentration of fine air particles
Crime rate	High school graduation rate	*average house prices / median income after tax,*	*Relative ratios of cohorts median income after tax*	Water quality in main watersheds
University graduation rate	Life expectancy at birth	*Stock of public infrastructure as a percentage of GDP*	*Relative ratios of cohorts unemployment rates*	
Overall Satisfaction with regard to life	Rates of major depression and perception of mental health	*Relative ratios of cohorts average tax rates*	*Government debt as % of GDP*	
Relative ratios of cohorts median net assets	Average age of elected representatives by election	*% GDP spend on education*	*% GDP on health spending*	
Average age of board members of large companies		*% GDP spend on childcare*	*% GDP spend on debt service*	

Table 4 Evaluation of the Strenghs and Weaknesses of IEI-16

Generational Relationships	**Scope of Equity Considerations**		
Equity between living generations	*Respect*	*opportunities*	*living standards*
Private Transfers between living generations	*Burden of caring*	*Private care, future life chances, discrimination and gender impacts*	*Savings, debt, inheritance*
Public Transfer between living generations	*Burden of public debt inherited*	*Fiscal fairness, burden of taxes and pension contributions*	*Value of investment, quality of social, economic* **and environmental systems**
Equity between living generations and future generations	**Legacy state of our planet, social and economic**	**Distributive justice of global impact of unsustainability**	**Rights based approach to the yet-to-born**

However, IEI-16 could evolve into a more comprehensive IESA technology. Its basic infrastructure could be modified to incorporate more generations and add in more indicators representing other aspects of sustainable development. A greater future orientation, including different sustainable development policies and future scenarios, would also enhance its effectiveness as an ISEA. The ability of local communities to create their own intergenerational equity accounts and engage with policy development is another advantage of this type of accounting.

UN Sustainable Development Goals

An important development in the sustainable development field was the publication of the United Nations Sustainable Development Goals (SDGs) as part of their 2030 Agenda for Sustainable Development (United Nations, 2015). Collectively the SDGs (see table five) represent an international political consensus on sustainable development and can form the basis for accountability and governance of sustainable development transformations. The 17 SDGs and 232 indicators apply to all countries and while not legally binding, governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals. Countries have the primary responsibility for accounting for progress made in implementing the Goals using the SDG indicator set. This section will evaluate the potential of the SDGs as a form of IESA.

Table 5 – United Nations Sustainable Development Goals

End poverty in all its forms	Ensure access to affordable, reliable, sustainable & modern energy for all	Take urgent action to combat climate change & its impacts
End hunger, achieve food security & improved nutrition & promote sustainable agriculture	Ensure inclusive , equitable quality education, promote lifelong learning opportunities for all	Conserve & sustainably use the oceans, seas & marine resources for sustainable development
Promote sustained, inclusive & sustainable economic growth, full & productive employment & decent work for all	Promote peaceful, inclusive societies for sustainable development, provide access to justice for all, building effective, accountable, inclusive institutions at all levels	Protect, restore & promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halting & reversing land degradation, biodiversity loss
Achieve gender equality & empower all women & girls	Reduce inequality within & among countries	Ensure healthy lives & promote wellbeing for all at all ages
Make cities & human settlements inclusive, safe, resilient & sustainable	Build resilient infrastructure, promote inclusive & sustainable industrialisation & foster innovation	Strengthen the means of implementation & revitalise global partnerships for sustainable development.
Ensure availability & sustainable management of water & sanitation for all	Ensure sustainable consumption & production patterns	

From a public sector perspective the SDGS are likely to inform the development of their accounting for sustainable development, including intergenerational equity as intergeneration equity is a key aspect of sustainable development (Gray, 2010; Attfield, 2010; Norton, 1999; Roemer and Suzumura, 2007; Thomson et al. 2014). The obligation of the current generations to future generations is embedded within all definitions of sustainable development, therefore it would be expected that the SDGs and indicator set would incorporate explicit measures of achievement of intergenerational equity.

However, the indicator set is largely dominated by intragenerational indicators and indicators of 'living' generations intergenerational equity. In terms of intergenerational equity the UN SDGs and related indicator set can be seen as representing a process from which intergenerational equity is

expected to emerge. The SDGs represent a clear normative and comprehensive representation of the key dimensions of intergenerational equity. However the SDGS have a limited time frame of 15 years, significantly lower than the average 30 years of a generation and shorter than the 40 years of the Australian government's generational accounts. Within the SDGs generations are defined similar to that used in generational accounting, although they do break down the under 16s into more detailed cohorts, for example under 5 years old, primary school children and secondary school children.

From this review intergenerational equity for future generations is assumed to emerge from the achievement of the SDGs and inferred from movements in indicators related to investment programmes. Similar to IEI-16, SDGs have a historic bias, lacking the future orientation of generational accounting or seven generation thinking (Lyons, 1994). However, the SDGs contain clear normative outcomes that are infused with intergenerational and intragenerational equity considerations.

Similar to IEI-16 the SDGs can be modified to create more effective IESA through incorporating future scenarios and, projections into the longer term. The SDGs are the most comprehensive of the intergenerational equity accounting practices evaluated in this paper and arguably have the greatest potential to develop into effective ISEA. Table 5 provides a summary of the strengths and weaknesses of SDGs.

Table 5 Evaluation of the Strengths and Weaknesses of SDG

Generational Relationships	**Scope of Equity Considerations**		
Equity between living generations	*Respect*	*opportunities*	*living standards*
Private Transfers between living generations	*Burden of caring*	*Private care, future life chances, discrimination and gender impacts*	*Savings, debt, inheritance*
Public Transfer between living generations	*Burden of public debt inherited*	*Fiscal fairness, burden of taxes and pension contributions*	*Value of investment, quality of social, economic and environmental systems*
Equity between living generations and future generations	*Legacy state of our planet, social and economic*	*Distributive justice of global impact of unsustainability*	**Rights based approach to the yet-to-born**

Conclusion

Bebbington et al., (2017) argue that conventional accounting is most suited to problem spaces with agreed standards, linear cause-effect relationships, a single outcome, consensus over valuation protocols, preference for historical evidence and reliable information sets. As argued in this review intergenerational equity does not fit into this conventional accounting problem space. Despite the historical influence of intergenerational equity and public sector accounting (Pallot, 1994; Robinson, 1981, Colquhoun, 2010), the challenges associated with IESA are substantial. The intergenerational

equity problem space is future oriented, socially constructed, ethical in nature, multi-dimensional, multi-disciplinary, political and scientific and largely unknowable in relation to conventional accounting norms. Yet the need to account for intergenerational equity is critical to the achievement of sustainable development.

This review has sought to present the case for IESA, as well as identifying the challenges, conceptual and practice, of developing effective IESA. These challenges can be interpretted as a framework to evaluate different forms of intergenerational equity accounting.

These challenges include identifying the implicit notion of equity associated with IESA, evaluating the appropriateness of definitions of generation embedded with these accounts, the appropriateness of the measures of equity in relation to the concept of sustainable development, any normative outcomes associated with IESAs, the scope of these accounts, the time orientation of these accounts, how far into the future they extend, the intentions and legitimacy of the intergenerational equity account preparers.

These challenges can also be used as a potential design template for new forms of IESA that could make visible, thinkable and governable a sustainable transformation that enables the achievement of intergenerational, as well as, intragenerational equity.

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